Roadway Capacity Studies

Studies of roadways are used to determine the practical capacity of roads and streets; to provide a basis for changing traffic regulations, establish priorities for street improvement; and to assist in future planning.

Traffic density is the number of vehicles per hour passing any selected point on a road, or the number of vehicles per mile on a selected portion of road.

Traffic capacity is the maximum traffic density a road can accommodate at a given speed without delay.

Before the actual capacity of a roadway can be determined, it it necessary to find the **theoretical capacity.** The formula N = 1760V divided by I is used for finding the theoretical capacity for one lane of a roadway. (See the formula explanation on page 150.)

An ideal road is one which has an excellent surface, zero grade, zero curves and no interference such as intersections. There are, however, no ideal roads. The theoretical capacity of a road is modified to account for existing circumstances. Three factors determine the **actual capacity of a road—physical characteristics of the road, characteristics of the traffic using the road and traffic controls used on the road.**

A good rule of thumb to use when estimating the actual capacity of a road is to reduce the theoretical capacity by 25 percent.

If a more detailed analysis of a roadway's capacity is needed, the assistance of a traffic engineer is required, since the study and computation of factors affecting capacity is detailed.

The capacity of a roadway can be improved in these ways:

Eliminate curb parking or convert angle parking to parallel parking, if on-street parking is essential.

Eliminate left and right turns.

Properly define lanes.

Relocate bus stops.

Relocate objects near edges of the roadway.

Speed (km/h)	Speed (miles) per hour)	Vehicles lead (Yards/meters)		Traffic density (vehicles per miles/km)	Traffic flow (vehicles per hour)
8	5	17	15	103	518
16	10	22	20	80	800
24	15	28	26	63	941
32	20	36	32	49	976
40	25	44	40	40	1,000
48	30	53	48	33	995
55	35	62	56	28	994
6472	40	70	62	25	1,006
	45	79	71	22	1,003

Theoretical Traffic Capacities for Single-Lane Movements

$$N = \frac{1760V}{I}$$

N— Theoretical traffic capacity, expressed in vehicles per hour.

V— Constant vehicular speed, expressed in miles per hour.

I— Intervehicular lead, expressed in yards. (Intervehicular lead is defined as the distance from the front of one vehicle to the front of the next vehicle in the traffic column.)